



# **Scientific Grade CCD Spectroradiometer & Integrating Sphere Test System LPCE-2(LMS-9500)**

## **Brochure**

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**Leader in Lighting & Electrical Test Instruments**

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**Note the following: If you need to test the single LED or LED Chip, you should choose the items which marked by **Blue****

## 1、 Scientific Grade CCD Spectroradiometer

LMS-9500 Scientific Grade CCD Spectroradiometer fully meets Energy Star IESNA LM-79 and GB/T24824 standards etc. It is test for CFL, HID, Promise Light, Tungsten Halogen Lamps, which can reach the scientific grade measurement accuracy. LMS-9500 is composed of Concave Average Diffraction Grating and Scientific Grade CCD, and uses unique stray light control technology, wide dynamic linear technology, precision CCD electronic drive technology and complex matrix software technology, the instrument can be traceable to the Chinese National Institute of Metrology(NIM) and the USA NIST standards.



### Specifications:

- CCD Detector: Hamamatsu TE-cooled (Temp:  $-10^{\circ}\text{C} \pm 0.05^{\circ}\text{C}$ ) high sensitivity back-thinned CCD (LMS-9500B); Hamamatsu high sensitivity back-thinned CCD (LMS-9500A)
- Spectral Range Wavelength: 380nm~800nm (200~800nm and 380~1050nm are option)
- Spectral Wavelength Accuracy:  $\pm 0.2\text{nm}$ , Resolution:  $\pm 0.1\text{nm}$ , Sample Scanning Steps:  $\pm 0.1\text{nm}$
- Accuracy of Chromaticity Coordinate ( $\Delta x, \Delta y$ ):  $\pm 0.0015$
- Correlated Color Temperature CCT: 1,500K~100,000K, CCT Accuracy:  $\pm 0.2\%$
- Color Rendering Index Range: 0~100.0, Accuracy:  $\pm (0.3\% \text{rd} \pm 0.3)$
- Photometric linear:  $\pm 0.2\%$ , Stray light:  $< 0.015\%$ (600nm) and  $< 0.03\%$ (435nm)
- Time of integration: 0.1ms-60s
- Total flux testing method: Spectrum, Photometric and Spectrum with Photometric revision
- Spectrum sensor: SMA905 optical fiber

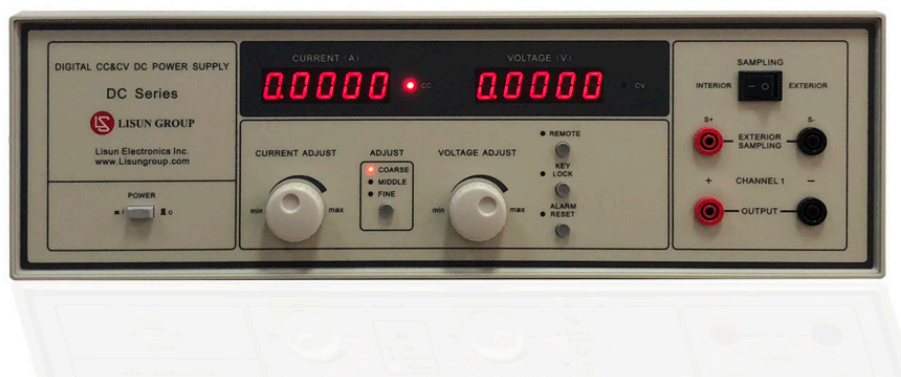
## 2、 Optical Fiber (CFO-1.2MS)



1.2m length Connect the Spectroradiometer LMS-9500 and integrating sphere

## 3、 Digital CC and CV DC Power Supply

The DC Series Power Supplies are with high stability and high accuracy. The voltage and current can be adjustable and simple operation. They are suitable to supply DC Power for the standard lamps.



### Specifications:

- Accuracy of Voltage and Current:  $\pm(0.02 \text{ Reading} + 0.01\% \text{ Range} + 1 \text{ Digit})$
- Stability of Output Voltage/Current:  $\pm 0.01\% \text{ Reading}/3\text{min}$
- Digital control for Constant Current output or Constant Voltage output
- Communicate with PC via software, the Voltage & Current set by the software and Power Output can be remote controlled.

Model	DC3005	DC3010	DC6005	DC6010	DC12005
U Range	0.0005-30.000V	0.0005-30.000V	0.0005-60.000V	0.0005-60.000V	0.0001-120.00V
I Range	0.0005-5.0000A	0.0005-10.000A	0.0005-5.0000A	0.0005-10.000A	0.0005-5.0000A

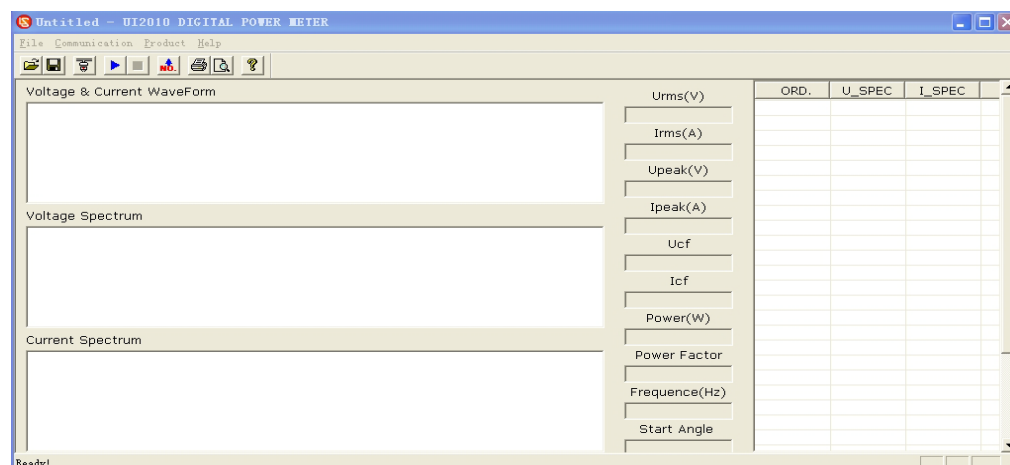
## 4、 Digital Power Meter



- Measure Voltage, Current, Power and Power Factor.
- Voltage range: 10~600V; Current range: 0.005~20A
- Accuracy:  $\pm(0.4\%\text{reading} + 0.1\%\text{range} + 1\text{digit})$
- Communicate with PC. It can communicate with LISUN spectroradiometer

Model	Measure	Remark
LS2008R	AC Parameters: U, I, P, PF	
LS2010	AC Parameters: U, I, P, PF and harmonic	Special Software can show harmonic in Win7 or Win8
LS2012	AC+DC Parameters: : U, I, P, PF	DC: 1~600v, DC Current Range: 0.005~20A, out of limit alarming
LS2050	AC+DC+Harmonic with high test accuracy	Special Software can show harmonic in Win8 or Win8

The LS2010 has a separately software can do harmonic analysis as below



## 5、 AC Power Source



- AC-DC-AC frequency conversion technology, Controlled & tested by 16 bits MCU
- Protection for over hot, thundering voltage and current
- Total voltage distortion:  $\leq 0.6\%$ ; Voltage stability:  $\leq 0.1\%/30\text{min}$
- Load adjust rate:  $\leq 0.1\%$ ; Frequency stability:  $\leq 0.05\%/30\text{min}$
- Output voltage range: AC 0.0~300.0V, Output Frequency Range: 45~70Hz, 100Hz, 200Hz and 400Hz
- Input Power: 220V and 50/60Hz
- Communicate with PC via software, the Voltage & Current set by the software and Power Output can be remote controlled.

Lisun Model	Output Power	Remark
LSP-500VAS LSP-500VAR	500W	0~150V: 4.2A, 150~300V: 2.1A (LSP-500VAR is pure sine wave AC power source with low harmonic and high accuracy)
LSP-1KVAS LSP-1KVAR	1000W	0~150V: 8.4A, 150~300V: 4.2A (LSP-1KVAR is pure sine wave AC power source with low harmonic and high accuracy)

## 6、 New Design Integrating Sphere

Due to the LED luminaries such as LED street luminaries developed, to do 4 $\pi$  geometry testing, it is hard to be hold in the traditional integrating sphere design. To solve this problem, LISUN design a new kind of sphere.



A Molding Integrating Sphere VS the traditional Integrating Sphere

LISUN new Integrating sphere has the following advantages:

- The hold base can bear max 20kg, it can test all kinds of luminaires and light source such as E27/E40, all tubes such as T5/T8/T12 and all kinds of luminaries
- The hold base can be installed in the ceiling or down, height can be adjustable
- The test hold base has four power cables connect to the outside Power Supply and max is 5KW
- Build-in Cross laser system which help to install the standard lamp and testing lamp in the center of the integrating sphere



Build-in Cross Laser System

**Specification:**

- Diameter: 0.3m, 0.5m, 1.0m, 1.5m, 1.75m, 2.0m, 2.5m and 3.0m
- The painting of integrating spheres is according to CIE Pub.No.84(1989)
- BaSO<sub>4</sub> coating:  $\rho(\lambda) \geq 0.96(450\text{nm} \sim 800\text{nm})$  and  $\rho(\lambda) \geq 0.92(380\text{nm} \sim 450\text{nm})$
- Fine diffuse reflection: Reflectance  $\rho \approx 0.8$  and accuracy of  $\rho(\lambda) < 1.5\%$

**Order Number:**

Sphere Diameter	1.0m	1.5m	1.75m	2m
LISUN Model	IS-1.0MA	IS-1.5MA	IS-1.75MA	IS-2.0MA
Cycle side opening	IS-1.0MA33C	IS-1.5MA55C	IS-1.75MA66C	IS-2.0MA77C

**Remark:**

The code 55C in IS-1.5MA55C means the side opening is diameter=50cm cycle size



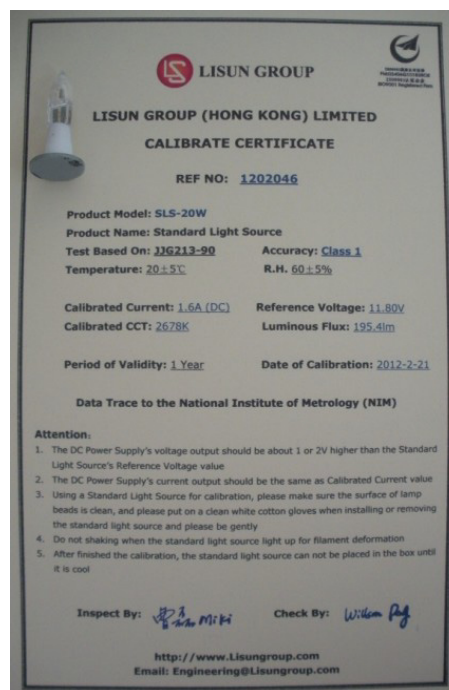
## 7、 Auxiliary Lamp (RLS-50W)

Due to the luminaires material has self-absorption, the test flux will be a bit difference than the original flux when test the luminaires in the integrating sphere, according to CIE request, it is necessary use an Auxiliary lamp to do flux self-absorption revise.

## 8、 Standard Lamp Source

OSRAM Standard Lamp to calibrate the spectrum and luminous flux with Lisun Lab certification. The data can be traced NIM. The Standard Lamp Source is used to calibrate the integrating sphere system. The different size of Integrating Sphere should choose the right power of standard lamp source

Integrating Sphere Size	Standard Lamp Source
0.3m/0.5m	SLS-10W
1m/1.5m/1.75m	SLS-50W
2m/2.5m/3m	SLS-100W



## 9、 19Inch Cabinet (CASE-19IN)

Combine all of the test instruments in a 19 inch standard Cabinet, makes the whole systems looks nice and is simple to use



**The next pages are LPCE-2 (LMS-9500) Test Report.**

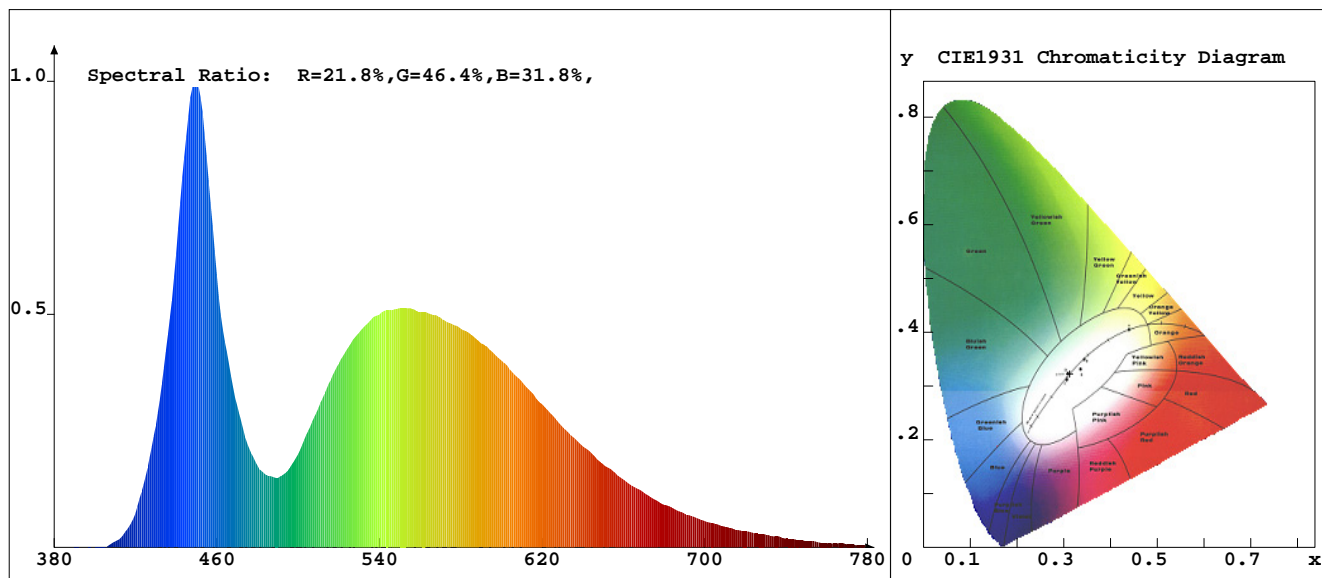


## LED Test Report

### Product Mark

Model No. :  
Temperature :25'C  
Operator :Hans Jan  
Remark :

Manufacturer :CREE inc  
Humidity :65%  
Test Date :2018-05-14



### Chroma Parameters

Chro.Coord.:x=0.3127 y=0.3225 u=0.2003 v=0.3099 duv=-0.0002  
CCT: 6555K Dominant Wave.:485.7nm Purity:7.8%  
Flux RGB Ratio:R=12.2%,G=84.2%,B=3.6% Peak Wave:448.8nm Half Width:24.9nm

### Rendering Index:Ra= 75.2

R1 =73	R2 =79	R3 =80	R4 =75	R5 =74	R6 =70	R7 =85	R8 =66
R9 =-10	R10=47	R11=71	R12=42	R13=75	R14=89	R15=0	

### Photo Parameters

Flux:215.72lm Effi.:53.9lm/W Radiant:679.9mW

### Ele. Parameters

Forward Current:If=0.0mA	Reverse Voltage:Vr=5.00V
Forward Voltage:Vf=0.00V	Reverse Current:Ir=0.00uA

### Instrument state

Instrument Type:Lisun LMS-9500A Integral Time: 112.339ms VPeak: 13397  
Instrument ID: 0 Scan Range: 380-780nm VDark: 1415